

Remarks

Reconsideration of the application in view of the above amendments and the following remarks is respectfully requested. Claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 have been amended. No additional claims have been canceled or added. Claims 1-4, 7, 9-17, 19-28, 30-40, 42-52, 54-64, 66-76, 78-83, 85, 87-89, 91, 93-95, 97, 99-101, 103, 137-154, 161-165, 167-168, 175-179, and 181-182 are currently pending in the application.

In the Office Action, the Examiner rejected claim 87 under 35 U.S.C. §112, second paragraph, as being indefinite. Particularly, the Examiner correctly noted that the term "said first route" lacked antecedent basis. Claim 87 has been amended to correct this oversight. Thus, Applicant requests that this rejection be withdrawn.

In the Office Action, the Examiner rejected claims 1-4, 10-17, 20-22, 24, 27, 28, 31, 33, 34, 36, 39, 40, 43, 45-52, 55-58, 60, 63, 64, 67-70, 72, 75, 76, 79-83, 87-89, 93-95, and 99-101 under 35 U.S.C. §103(a) as being unpatentable over Rochberger et al. (U.S. Patent No. 6,272,107) in view of Wicklund (U.S. Patent No. 6,034,958). Independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 have been amended to claim the invention more distinctly.

Independent Claim 1

As amended, claim 1 now recites:

A method for recovering from a failure in a network, comprising:

sending a first set of information from a source to a destination via a first route,  
wherein said first set of information traverses a path which encompasses at least a portion of said first route;  
detecting a failure along said first route;  
in response to said failure, directing a message to said source informing said source of said failure; and  
in response to said message, sending a future set of information from said source to said destination via an alternate route;  
wherein directing said message to said source comprises:  
    identifying said source;  
    accessing a routing table which comprises one or more routes to said source;  
    obtaining a return route from said routing table, wherein said return route directs said message to said source along a different path than that traversed by said first set of information; and  
    sending said message to said source via said return route.

As indicated by the underlining, claim 1 has been amended to point out that when a first set of information is sent from a source to a destination, the first set of information traverses a path which encompasses at least a portion of a first route. Claim 1 also specifies that when a message indicating a failure is sent back to the source, the message is sent on a return route that directs the message along a different path than that traversed by the first set of information. Thus, the first set of information and the message travel along different paths (i.e. routes).

There is ample support in the Specification for this amendment. For example, on page 18, lines 15-21, it is stated:

A point to note regarding routing table 322 is that, unlike the forwarding table 320, the routing table 322 is unique to each line card 202. That is, each line card 202 has a different routing table 322. This is because the routing table 322 specifies the potential routes from a particular line card 202 (i.e. the line card on which the routing table 322 is stored) to every other line card 202 in the router 102. Since the routes to a line card 202 will differ depending upon the starting line card, each line card has different routes to every other line card. Thus, the routing table 322 will vary from line card to line card.

Also, on page 21, lines 8-11, it is stated:

As was the case with the routing tables 322 of the line cards 202, the routing table 422 of the fabric card 206 is unique to each fabric card 206. Thus, each fabric card 206 will have a different routing table 422 stored thereon.

Further, Fig. 6 shows that each routing table contains multiple possible routes to each other card. Since each card (whether it is a line card or a fabric card) has its own unique routing table, and since each routing table comprises multiple possible routes to each other card, it follows then that the first route chosen by the source for carrying the set of information will most likely, if not definitely, be different from the return route obtained by another card for directing the message back to the source to inform the source of the route failure. Thus, the paths traversed by the first set of information and the message are most likely, if not definitely, different.

This aspect of Claim 1 is neither disclosed nor suggested by Rochberger and Wicklund, taken individually or in combination. Instead, Rochberger discloses a method for recovering from a network failure in a connection-oriented network (specifically, an ATM network). In Rochberger, two paths (a primary path and a redundant path) are established between a source node and a destination node (Col. 7, lines 13-31; Figs. 2 and 3). Each path may include one or more transit nodes. When a break or failure is detected in the primary path (Fig. 15), the transit node on each side of the failure sends out a special cell to the end nodes (the source and destination nodes). Specifically, the transit node on the side of the break closer to the source node sends the special cell to the source node, while the transit node on the side of the break closer to the destination node sends the special cell to the destination node (Col. 5, lines 27-39; Col. 15, lines 55-65). This special cell indicates to the source node and the destination node that traffic should be rerouted from the primary path to the redundant path. In response to this special cell, the

source node and destination node stop using the primary path and switch over to the redundant path. In this manner, the network detects and recovers from the failure.

A point to note regarding Rochberger is that, unlike claim 1, when the transit node sends the special cell back to the source node, the transit node does not direct the special cell along a different path than that traversed by an original data cell. Rather, the special cell traverses the same path (albeit in a reverse direction) as that traversed by the original data cell. This is shown clearly in Fig. 17 of Rochberger.

Specifically, Fig. 17 shows that the source node sends a data cell to the input portion 310 of a first port of a transit node. The switching fabric 312 of the transit node switches this cell to the input portion 316 of a second port. The data cell should thereafter travel from the input portion 316 of this port to the next transit node. However, because of the link failure (indicated by the large X), this is not possible. Thus, the switching fabric 312 redirects (as indicated by dashed line 313) the data cell and a special cell back to the output portion 314 of the first port (the same port on which the data cell was received). The special cell and data cell will thereafter be carried back to the source node. As this excerpt shows, when the transit node sends the special cell back to the source node, it directs the special cell through the same port, and hence, along the same path as that originally traversed by the data cell. The direction traversed by the special cell may be the reverse of that originally traversed by the data cell, but the path will be the same. Thus, unlike the method of claim 1, the transit node does not direct the special cell back to the source along a different path than that originally traversed by the data cell. This aspect of claim 1 is neither disclosed nor suggested by Rochberger.

This discussion underscores a subtle but very significant difference between Rochberger and claim 1. The method of Rochberger is intended to be implemented in an ATM network (ATM is a connection-oriented transport service; see Col. 1, lines 57-63). In an ATM network, paths are pre-established using VPI/VCI inbound and outbound pairs (Col. 7, lines 49-61). Because paths are pre-established, it is not necessary for a transit node in an ATM network to choose a route to use to direct the special cell back to the source node. Instead, all the transit node has to do is to send the special cell back to the port from which the original data cell was received. If each port of each transit node does this, then the special cell will traverse the same path (albeit in the reverse direction) as that traversed by the original data cell, and the source node (barring another failure) will be assured of receiving the special cell. This is in sharp contrast to the method of claim 1. The method of claim 1 is intended to be implementable in any type of network, including those in which paths are not pre-established. In networks in which paths are not pre-established, a node has to choose a return route to use to direct a failure message back to a source. As noted above, this return route will most likely, if not definitely, be different from that used by the source to send the original set of information. Thus, the failure message and the original set of information will most likely, if not definitely, traverse different paths. This aspect of claim 1 is not disclosed or suggested by Rochberger. Because the two methods are intended to be used in different types of networks, the fact that Rochberger does not disclose or suggest this aspect of claim 1 should come as no surprise. Because at least this aspect of claim 1 is not disclosed or suggested by Rochberger, Applicant submits that claim 1, as amended, is patentable over Rochberger, taken individually.

Claim 1 is also patentable over Wicklund, taken individually. There is nothing in Wicklund that discloses or suggests the aspect of claim 1 discussed above, and the Examiner has made no assertion that Wicklund discloses this aspect. Thus, Applicant submits that claim 1 is also patentable over Wicklund, taken individually, for at least this reason.

Even if the references were combined (assuming for the sake of argument that it would have been obvious to combine the references), the combination would still not produce the method of claim 1. As argued above, neither reference discloses or suggests directing a message back to the source along a different path than that originally traversed by a first set of information. Thus, even if the references were combined, this aspect of claim 1 would still be missing. Thus, for at least this reason, Applicant submits that claim 1 is patentable over Rochberger and Wicklund, taken individually or in combination.

Independent Claims 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99

Each of the independent claims 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 has been amended to incorporate substantially the same limitation as that discussed above in connection with claim 1. Thus, applicant submits that these independent claims are patentable over Rochberger and Wicklund for at least the same reasons as that given above in connection with claim 1.

Other Applied References

In various rejections of dependent claims, the Examiner also applied U.S. Patent No. 6,167,025 issued to Hsing et al. and U.S. Patent No. 6,560,654 issued to Fedyk et al. These references suffer from the same shortcomings as Rochberger and Wicklund. Specifically, neither of these references discloses or suggests the additional limitation discussed above. Thus, even if these references were combined with Rochberger and Wicklund (assuming for the sake of argument that it would have been obvious to combine the references), the additional limitation still would not be disclosed. For at least this reason, Applicant submits that independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 are patentable over all of the applied references, taken individually or in combination.

Applicant further submits that all of the dependent claims which depend from independent claims 1, 11, 21, 33, 46, 57, 69, 81, 87, 93, and 99 are likewise patentable over all of the applied references.

Allowable Claims

In the Office Action, the Examiner allowed claims 137-154, 161-165, 167, 168, 175-179, 181 and 182. Applicant thanks the Examiner for this allowance.

For the foregoing reasons, Applicant submits that all of the pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all pending claims is hereby respectfully solicited.

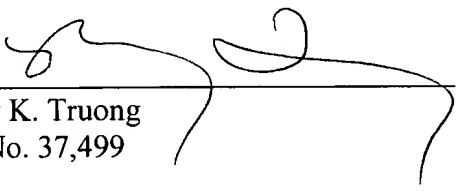
The Examiner is invited to telephone the undersigned at (408) 414-1080 ext. 234 to discuss any issue that may advance prosecution.

If any applicable fee is missing or insufficient, throughout the pendency of this application, the Commissioner is hereby authorized to charge any applicable fees and to credit any overpayments to our Deposit Account No. 50-1302.

Respectfully submitted,

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on July 6, 2006

by

  
Susan Jensen